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ABSTRACT

In order to accurately assess quality education, it is essential to obtain objective information about student performance in a given school. Before this can be done, it is necessary to determine exactly what factors are related to student performance. Quality education implies goals, methods of reaching them, and criteria to judge progress in reaching them. An indicator is the measurement of a criterion of progress. In order to discuss indicators logically, Section I discusses their classifications. Indicators are seen as measures of input to the educational process, or as measures of the products (output) of the educational process, and some are seen as both input and output; that is, they are interactive. After a review of the literature, Section III describes briefly the Pennsylvania assessment program, student performance measures, indicators used in the Pennsylvania program, and procedures employed in the analysis and relationships observed among indicators. Although most of the observed relationships are based on the assessment of fifth and eleventh graders conducted between 1969 and 1973, additional findings on more recent assessment are also reviewed. In the final section, some citizen suggestions of indicators are translated from narrative statements to numerical codes. Such coding should give citizens a way to compare their school to another school or to some established standard. (RC)

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CONDITION VARIABLES IN RELATION TO MEASURED STUDENT PERFORMANCE:

The Use of Indicators in Pennsylvania

2

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CONDITION VARIABLES IN RELATION TO MEASURED STUDENT PERFORMANCE: The Use of Indicators in Pennsylvania

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COOPERATIVE ACCOUNTABILITY PROJECT
Denver, Colorado

November, 1975

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FOREWORD

Because quality education has become a local, state, and national concern, and since educational accountability now is an accepted practice in most areas, the question is continually being raised, "Do the schools have specific evidence on which to base their conclusions concerning student performance?"

As this publication indicates, condition variables or indicators of student performance are becoming a valid means of identifying educational conditions and assessing the quality of school programs.

Educational results or outcomes may be described in two ways: (1) proximate outcomes and (2) ultimate outcomes. Proximate outcomes are interpreted as those effects of schooling which are immediate, such as school-directed increases in cognitive proficiencies and alterations in attitudes. Ultimate educational outcomes refer to the resulting social effects of schooling in terms of their benefits (or costs) to society. It is generally believed that the educational process enhances citizenship and the ability of the individual to function effectively in terms of the democratic structure, productivity, and economic attainments. While these effects are several steps removed in time and location from the school setting, they represent the kind of outcomes or indicators now recognized as the ultimate objectives of education.

It must be acknowledged that the proximate outcomes of education are difficult to evaluate in relation to their ultimate effects. Consequently, the educational sector has tended to concentrate on evaluation of inputs rather than outcomes. Considerations of such factors as class size, teacher education, socioeconomic conditions, and use of innovative teaching methods are even more difficult to relate realistically to ultimate educational outcomes. Common assumptions that a school is good because it has small classes or high per-pupil expenditures need to be examined with care in a given school setting.

The Pennsylvania Department of Education has made an extensive and conscientious effort to identify certain variables relating to student performance in terms of proximate and ultimate educational outcomes. This monograph reviews key elements of the Department's efforts to date and provides guidelines which can be of great value to other educators who wish to apply the concept of indicators to measured student performance. The authors, J. Robert Coldiron and Eugene W. Skiffington, have provided outstanding leadership in the development and use of indicators in Pennsylvania, and readers wishing further information concerning the concepts presented in this document may contact the writers through the Division of Educational Quality Assessment, Pennsylvania Department of Education, Harrisburg, Penn., 17126.

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INTRODUCTION

Schools, as we know them, serve their communities in many ways. They help students develop reading, writing, arithmetic and vocational skills; they provide forums for students for the development of understanding of self, of others, of history and of life processes; they serve as a catalytic agent in the formation of attitudes toward school, toward government, toward change and toward cultural achievements. Schools also serve as entertainment centers; they produce plays and sporting events. Schools provide a babysitting service, run a transportation system and serve meals to thousands of students. Because schools have become such an integral part of community life, it has become increasingly important to determine a way to distinguish a good school from a poor one. No single index --the number of students scoring above grade level on a verbal test, the friendliness of students, the existence of a language program, the achievements of the school's graduates-- can determine the quality of a school. Some attempt must be made to define those indicators which validly point to quality education.

Every parent wants the best education for his or her child and, after residing in a school district for some time, parents may have many sources for an opinion of what kind of a job the school is doing. These opinions may be based on reports their children bring home of what transpired in school or on the kind and amount of homework their children receive. Or the opinion may be based on more direct contact through parent-teacher conferences, "back-to-school night," PTA activities, etc. Similarly, parents may learn of school achievements through district newsletters used to draw attention to new programs, outstanding students or teachers,

college acceptances and other activities designed to generate support for the schools. Such personal observations are valid to a certain extent, but they are often colored by personal prejudices or misinformation. In order to accurately assess quality education, it is essential to obtain objective information about student performance in a given school. Before this can be done, it is necessary to determine exactly what factors are related to student performance.

The term "quality education" implies goals, methods of reaching them, and criteria to judge progress in reaching them. An indicator is the measurement of a criterion of progress. Although methods of reaching goals are not within the scope of this monograph except where they coincide with indicators of progress, Pennsylvania has established ten goals of quality education and has legislated that they be measured and that progress be reported.

Criteria of progress have many frames of reference, and any attempt to do justice here to all points of view would merely result in one more incomplete survey. The reader is advised to consult the literature if more detailed discussion is required.

This study is the result of a statewide assessment project and follows the lines and limitations of large-scale educational measurement techniques. As such, several assumptions have been made. The first assumption is that schools do have an effect on children's (and society's) progress toward goals. The second assumption is that the effectiveness of schools can be inferred from statistical relationships between goals and indicators. The third assumption is that these inferences will be of help to those interested in improving and maintaining quality education.

SECTION I

CLASSIFYING INDICATORS

To discuss indicators logically, it is first necessary to classify them in some way. The varieties of methods of collection, interpretation and ultimate uses to which indicators are put can make the classification of indicators a tremendously complex task.

One classification rationale centers around the contention that educational indicators should be signs of the health of the educational process. That is, they should indicate what the schools are doing in the way of good educational practices. If one accepts this rationale, a method of classification immediately presents itself. The indicators would be classified by how near they are to the actual processes of education. Thus, a rating of teaching practices would be judged immediate to educational processes; teacher's level of education, on the other hand, would be more remote with respect to the process. A good indicator would, by this classification method, be one which measures what goes on in the classroom.

Another scheme which might be used to indicate the degree to which the school is having an effect on the students is to classify indicators according to the extent to which the schools are capable of influencing output on those indicators. For example, schools can do little to manipulate IQ scores through educational processes. Conversely, schools do have some power to stimulate student performance on certain subject areas such as spelling or math. Figure 1 shows some of the indicators which might be classified by their process immediacy and manipulability. The Culture of Community variable, for instance, is shown to have some impact on the educational process, but not to be susceptible to direct influence by the schools.

FIGURE 1

CLASSIFICATION OF INDICATORS BY
PROCESS IMMEDIACY AND MANIPULABILITY

Nearness to Educational Process	School Influence		
	No Manipulability	Some Manipulability	Much Manipulability
Remote:	Civil Rights Legislation	Consumer Thrift	C[illegible]l S[illegible]
Approximate:	Culture of Community	Physical Plant	Extra-Curricular Activity
Immediate:	Students IQ	Teacher Attitudes	Lesson Plans

A second basic rationale for classifying indicators hinges on the assumption that one can tell how the schools are doing their job by studying the behavior of the students after graduation. Using this rationale, one would consult a social model for goals, measure how the population of graduates is meeting those goals, and blame the schools for the differences observed between the ideal and the real. A method for classifying these "social indicators" might be a scale of immediacy, such as shown on page ., the only difference being that the indicators would be more or less immediate with respect to the actual social effect desired. Thus, employment figures would be approximate, and attitudes toward work would be immediate indicators of progress on a social goal of work-related ethics.

Indicators have thus far been discussed as either measures of input to the educational process or measures of the products (output) of education. However, some indicators are both input and output; that is, they are interactive. Socioeconomic status, for example, is an excellent example of interactivity. A student of upper middle-class heritage is likely to go on to higher education. But is this true because he was motivated to higher levels of aspiration at home or at school? If the school raises levels of aspiration, is that a result of pressure from parents or the educator's higher level of expectation for this segment of society? And are not the parents' attitudes influenced by their own educational experience? The answers to these questions must be yes. In sum, the schools influence, and are influenced by, the students' cultural and economic background. Therefore, another method of classification might be the degree of interactivity between the indicator and the process or how much each influences the other. (See Figures 2 and 3.)

FIGURE 2

CLASSIFICATION OF INDICATORS BY
SOCIAL EFFECTS VS. INTERACTIVITY

Relationship of Desired Outcome to Educational Process	Educational Setting: High Self-Reinforcement	Moderate Self-Reinforcement	Low Self-Reinforcement
Remote:	Civil Rights Legislation	Consumer Thrift	Number of Graduates Studying Ecology
Approximate:	Number of National Merit Scholars	Percentage of Graduates Going To Higher Ed.	Safe Driving Practices
Immediate:	Students Level of Aspiration in Class	Percentage of Seniors Who Do Not Smoke	Percentage of Athletes Making State Final

FIGURE 3

CLASSIFICATION OF INDICATORS BY
PROCESS IMMEDIACY VS. INTERACTIVITY

Nearness to Educational Process	Educational Setting: High Self-Reinforcement	Moderate Self-Reinforcement	Low Self-Reinforcement
Remote:	?	Attitudes of Civil Authorities (e.g., Police)	Parent's Education
Approximate:	Extra-Curricular Activities	Culture of Community	Physical Plant
Immediate:	Student IQ Scores	Teacher Lesson Plan	Teacher Attitudes

Figure 2 illustrates some indicators which might be classified by their social effects and degree of interactivity. This model does not include intermediate steps in the process of interaction and self-reinforcement. For instance, a higher level of students' academic aspirations could result in improved performance, and the improved performance would, in turn, stimulate still higher levels of aspiration.

Figure 3 represents some of the indicators which might be classified by their process impact and degree of interactivity. The central indicator, Culture of Community, is one which is judged to be somewhat removed from the educational process, yet affects and is affected by the school in its many and varied functions. For example, a symphony orchestra may stimulate the music program in a school district and, in turn, assure its own continuance through the graduates who later find a place in its ranks. The upper left cell has been left blank because it is doubtful that an indicator can be found which is both remote from the educational process and highly interactive with it.

These analyses are not meant to be exhaustive, but merely to give an indication of some possible methods of classification. Many of the indicators could be placed in other cells without disrupting the basic divisions. Clear understanding of these relationships awaits further research.

Add to this polydimensional model the fact that most indicators are not indicators at all, but approximations or surrogates of what we want to measure. The result is that almost any scheme for the classification of indicators can have some justification, but none will ever completely satisfy all the demands that may be put upon it.

Educational Quality Assessment in Pennsylvania

The Pennsylvania Assessment Program is one of the most comprehensive studies relating inputs to school outcomes. The Pennsylvania program resulted from a legislative mandate which required the State Board of Education to establish a program designed to "measure objectively the adequacy and efficiency of the educational programs offered by the public schools of the Commonwealth." Initial efforts of the State Board resulted in conferences with civic and professional leaders which led to the adoption of ten goals of quality education. In order to determine how adequately schools were meeting these goals, a unit was created in the Pennsylvania Department of Education to translate the legislative mandate and the ten goals into a workable plan of assessment. Since 1967 this unit has been developing, refining and applying a model of assessment which provides school districts with information relative to their performance in these ten goals. This monograph will review those relationships in a later section.

SECTION II

SELECTED LITERATURE

There has always been great interest in identifying factors and practices that relate to the quality of schools, an interest that has been intensified by the evaluation and accountability movements of the 1970's. The body of literature concerning indicators and predictors of educational quality ranges from potpourri listings of indicators to sophisticated statistical analyses of relationships among the indicators. An exhaustive review of this literature would not be possible here; studies have been selected, however, to show some of the different approaches used in the research on educational indicators. Additional sources are listed in Appendix A.

Variables Related to Student Performance in Resource Allocation Decisions at the School District Level: A Survey of Research with Emphasis on the Policy Implications of the Findings.
Albany, New York: State Education Department, Bureau of School Programs Evaluation, 1972.

This study, one of the better reviews of the major problems involved in the examination of indicators of quality education, is a survey of research with emphasis on identifying relationships which had implications for policy decisions. Included were reviews of 62 of the recent, major studies which have attempted to relate school inputs to outputs. Major problems encountered with input-output studies, such as difficulty of specifying inputs, outputs and models for relating them, are covered. The study devotes a chapter to the different types of analyses that may be done with input and output relationships, such as linear and nonlinear models and socioeconomic analyses. The problems encountered in the aggregation of data and the problems of isolating individual indicators to ascertain their impact on particular outputs are also discussed.

The authors classified variables or indicators into two groups: indicators which are completely insensitive or nearly insensitive to policy control and those which can be manipulated by school administrations. Especially notable was the finding that inputs most consistently found related to student performance are not amenable to change. These variables include such things as the student's socioeconomic status, student IQ, race and the extent of the student's previous formal schooling. High socioeconomic status and high IQ, for example, are related to high levels of student performance. Also, studies have shown that the more whites in a school, the higher the level of performance. Student performance in these studies was usually measured with standardized achievement tests. Among the indicators found most amenable to change and relating to output were teacher degree status, teacher experience and verbal ability, textbook quality and the ratio of special staff, such as guidance counselors, social workers, etc., to pupils. According to this review, there is substantial consensus that indicators such as school district size, class size or the number of supervisors per pupil, and the quantity of textbooks and other instructional supplies are not related to student performance.

Although most of the studies used an achievement test as the output measure, many of the studies reviewed included noncognitive outputs such as self-esteem, interest in school, study habits or creativity. A third type of output, classified under the heading "Adaptability Studies," was also reviewed. These were studies in which process or adaptability measures of school quality were used. The input-output relationships were usually determined through some type of correlational or regression analysis. Input variables or indicators most frequently used in the

studies were the socioeconomic status of the students, teacher experience, educational expenditure level, IQ, teacher salary, school or district size, class size, books and other materials, student race, special staff, teacher degree status and teacher socioeconomic status.

How Effective is Schooling? A Critical Review and Synthesis of Research Findings.
H. A. Averch and others. Santa Monica: Rand Corporation, 1972.

Originating as a small interdisciplinary study to assist the President's Commission on School Finance, this review grew into a much larger survey supplemented by Rand corporate research funds. The survey purports to critically assess what is presently known about the determinants of educational effectiveness by examining the validity and credibility of research results. It is organized around questions concerning educational effectiveness and methods used to get results. The assumptions underlying each approach are analyzed so that the reader may have some sense of what to look for in research claims about the effectiveness of educational instruments.

The organizational scheme of the survey is based on five approaches to educational effectiveness and their underlying assumptions: (1) the Input-Output Approach, (2) the Process Approach, (3) the Organizational Approach, (4) the Evaluation Approach and (5) the Experiential Approach. Research studies were grouped under one of the five approaches, and those which did not satisfy minimum requirements of internal validity were then discarded. The study's general conclusions, based on the overall results of the many research efforts, were derived to obtain some form of inter-study consistency. These conclusions concerning what is known about educational effectiveness are in the form of five propositions which, though not optimistic concerning the usefulness of educational research,

nonetheless suggest some areas where educational expenditures could be cut with no appreciable loss of effectiveness.

The survey is an important one in that it organizes research into meaningful hierarchies and distills large quantities of material.

Associations Between Educational Outcomes and Background Variables: A Review of Selected Literature.
E. C. Bryant and others. Denver, Colorado: National Assessment of Educational Progress, 1974.

The purpose of this study by Westat Incorporated for National Assessment of Educational Progress (NAEP) was to provide a review of the most relevant findings relating educational outcomes to background variables with a view to making the variables more sensitive to educational decision making. Since NAEP's charge is to measure progress over time, another fundamental concern was to take into account background differences of various populations over time and to control statistically these differences while measuring change.

The methodology used is a highly statistical approach which identifies that fraction of variability in the educational outcome which can be accounted for by its correlation with one or more background variables. Fifty-three cited studies, representative of the most noteworthy contributions to this method of showing educational progress, were selected from a bibliography of several hundred items.

The study is organized under two major headings which are forms of educational outcome. The first is "Correlates of Academic Performance," in which the background variables are assigned various characteristics according to their relationships to outcomes of a purely cognitive nature. These are the short-range effects of education. The second major division of educational outcomes has to do with long-range effects and includes

factors that influence further education, occupation, income, job histories and other outcomes. Both headings relate the outcomes to measures of socioeconomic status, school variables, and such personal characteristics of the students as attitudes, motivation, self-perception, aspirations, etc. Also included are other variables which relate more specifically with the short- or long-range outcomes.

The review is a valuable reference manual for those designing assessment models or decision-making models with a research-oriented data base because it presents most of the findings that have become a standard part of the educators' working vocabulary. In addition, it relates the cited studies to the well-known NAEP assessment model.

Profiles of Excellence: Recommended Criteria for Evaluating the Quality of a Local School System.
Washington, D.C.: National Education Association, Office of Professional Development and Welfare, 1966.

In Profiles of Excellence, the National Education Association examined a broad range of variables in an attempt to provide local school personnel with guidelines for conducting a comprehensive self-study and evaluation of a school system. The variables examined were concerned primarily with policy, administration and professional staff considerations. There were no student variables included in the study.

The nine major sections deal with topics such as the Board of Education, Professional Compensation, Education Program and Personnel Policies. Within each section there are many subtopics which are rated on a five-point scale, ranging from inferior to superior performance. A narrative description is provided for each topic so that the rater can more accurately assess his school's performance. For example, in the section, "Conditions and Professional Service," there is a subtopic, "Work

Load." The inferior school would (1) have some staff members assigned to substantially heavier work loads than others, (2) give little consideration to class preparation time or outside class activities in establishment of the work load, (3) call for a longer workday than necessary for carrying out professional responsibilities, and (4) not provide extra compensation for extra duties on an equitable basis. In the superior school, at the other end of the continuum, the written policy would specifically define appropriate work loads for its staff members. Consideration would be given to such factors as composition of classes, necessary out-of-class planning and noninstructional responsibilities. The schedule and assignments would be balanced so that staff members would have reasonably equal loads. After reading the descriptions, the rater is to mark the level at which his school falls. If the score is not within the desired range, he would write down the action needed to close the gap toward the superior end of the continuum.

This profile does caution readers that the existence of a well-written policy does not always guarantee that a sound educational program does exist, for a system could be ignoring the desired policy in practice.

This profile is primarily descriptive; no attempt is made to consider relationships between variables or the relationship the variables they have highlighted might have with respect to student performance. The study would be valuable for persons wishing to do a descriptive analysis of their school system. The primary weakness is the lack of emphasis on student outcome variables.

Indicators and Statewide Assessment.
R. Clemmer and others. Salem, Oregon: State Department of Education, Division of Planning, Development and Evaluation for the Cooperative Accountability Project, 1974.

Indicators and Statewide Assessment is the first in a series of

publications sponsored by the Cooperative Accountability Project on indicators. The Oregon work lays out some of the basics concerned with using indicators to ascertain the quality of education or the progress being made toward achieving goals of education. This work is designed primarily for state-level assessments but could be useful to persons in large school districts.

The study is organized into six sections and discusses major problems of identifying goals and defining indicators and possible uses of indicators in different studies. It also identifies many sources from which data can be obtained.

Oregon provides definitions for both the terms "assessment" and "indicator." Assessment describes "a comprehensive effort to gather information on the status progress toward the desired goals and objectives for the purpose of state-level decision making." An indicator is "a descriptor, in quantifiable terms, of the status at a specified point in time of a significant condition or variable which provides evidence useful for an analysis of progress toward a goal or objective." For Oregon, an indicator must be quantifiable; that is, the data do exist, can be collected and can reveal "how much of the indicator exists." Also, the indicator must be related to some goal and must be associated with some point in time.

Oregon classifies indicators into four groups. One group is labeled "input" and is defined as a condition over which a school has some control and which could effect the school's ability to achieve a goal. Their second classification is called a "context indicator," and it describes a condition over which the school has little or no control. An example of this would be the socioeconomic background of students or the ability of

the students. The third classification, labeled "performance indicator," describes some type of measurable or observable behavior which could be used to determine program effectiveness or efficiency. Some examples would be student performance scores or some measure of instructional progress. The fourth classification, "societal indicators," describes some measurable aspect of the social condition affected to some degree by education. The examples given by Oregon were the number of arrests for delinquency, suicide rate for young adults or employment rate for recent graduates. The paper provides some examples which show how their classifications of indicators are related to their goals.

The point made in the Oregon paper which should receive more emphasis is the role of the school with respect to certain of the indicators, particularly the societal indicators. The authors indicate the state departments should be cautious in making unsubstantiated claims about the trends recognized through indicators. Another caution that should be added is discussed by Gross when he said, "The decision to observe the phenomenon implies the decision to be responsible for it, if such responsibility is within one's power." He continues:

> ...whether one tends to assume responsibility or not, the knowledge that phenomenon are being observed will create the expectation that such responsibilities will be assumed. For example, measurement of the aspirations of Negro youth seems to offer a valuable contribution to our understanding of the movement of Negroes into the mainstream of American life. However, the making and publication of such measurements will undoubtedly call attention to the disparity between the expectations we have created and our ability to meet those expectations....(1)

The Oregon monograph lists many indicators and their sources. However, many of these indicators are societal, and there is some doubt that researchers could agree that a relationship exists between these indicators and the goals of schools. Schools would do well to heed the admoni-

tion of the Oregon authors when they say "distinguish carefully the degree of responsibility which can be realistically and politically assumed when establishing proposed outcomes." For example, some of the indicators listed by Oregon are the number of voters registered, number voting in the election, number of arrests, number of crimes reported in a period of years and even number of business failures in a period of time. While one may argue that education is somehow related to these indicators, the direct relationship or direct impact that education would have on these particular indicators is very difficult to ascertain. Educators would do well, then, to pay close attention to the Gross' warning against arousing expectations beyond what can be delivered. Gross states, "It is wisdom, not cynicism, to urge caution in extending the diagnostic measures of social phenomena beyond the system's capacity to respond to the problems which are unveiled."(2) Educators have too often succumbed to the idea that schooling is the answer to all of society's woes. There are some very real limits to what schooling can do for society. It is time to face up to what these limits are.

Using Educational Indicators for Program Accountability
Michael J. Grady, Jr. Denver, Colorado: Cooperative Accountability Project, 1974.

This monograph is designed as a guide to the use of indicators by school district personnel concerned with evaluating the effectiveness of their school programs. As a guide, the paper does provide many useful ideas regarding an approach to using indicators as a way of determining the effectiveness of schools. Grady discusses the reasons for the uses of indicators and provides some stimulating questions that might be asked in determining how well schools are performing. Grady cites four basic questions that educators that must ask:

1. How are our students doing in school?
2. How do students fare after they leave school?
3. How can this information be of assistance to our instructional staff?
4. Are we getting as much as we should for our school dollar?

As Grady indicates, these basic questions will give rise to many others. These questions, therefore, have great implications, because in order to answer them, the educator must ask other questions such as, "What do we want our schools to do for the students?"

The problem of locating information is addressed by Grady in his third chapter in which he lists the different sources of information and what data could be obtained from each. This list should be a great assistance to citizens' committees that might not be aware of the vast amount of data already collected. The problem with this listing is similar to that found in the Oregon paper; that is, many of these pieces of information would be very difficult to relate to schools directly. For example, it is not clear how one might relate an indicator such as patient care facilities in a hospital or the number of persons 65 years of age or older to a quality educational program. Nevertheless, this list of indicator information is quite comprehensive and should provide good direction to persons embarking on an indicator study.

Persons embarking on such a study, however, may be misled by Grady's description of who might carry out an indicator study program. Grady suggests that large districts may have someone on their testing staff who has the necessary background in testing measurement, psychological statistics or research design. He also suggests that smaller districts, which might not have such a person, could assign this responsibility to either a head counselor or a head of the mathematics department. Such a statement seriously underestimates the vast problem of compiling information

into a meaningful report; one must be very hesitant in accepting Grady's premise that a counselor or a math person has the necessary qualifications to carry out this task. Additionally, if such a task were assigned on a part-time basis to a person of this sort, it may mean that the school district does not put a great deal of weight upon this type of study. Therefore, the acceptance of any report generated from the study may be very low.

Grady also provides a section on how one might prioritize objectives and indicators. He outlines a classification scheme and demonstrates how one might fit certain indicators into this scheme. This exercise might be useful in clarifying thinking about the value of indicators for the school.

With the exception of the underestimation of the amount of effort it would take to build a good accountability assessment at the local level, Grady's monograph should be very helpful for persons beginning a program designed to develop a profile of their school through the application of indicator information.

SECTION III

RELATIONSHIPS BETWEEN STUDENT PERFORMANCE AND OTHER INDICATORS: PENNSYLVANIA ASSESSMENT RESULTS

This section will describe briefly the Pennsylvania assessment program, student performance measures, indicators used in the Pennsylvania program, procedures employed in the analysis and relationships observed among indicators. Although most of the observed relationships are based on the assessment of fifth and eleventh graders conducted between 1969 and 1973, additional findings on more recent assessments also will be discussed.

The Pennsylvania Program

In 1969, after two years of extensive developmental work, Pennsylvania began a statewide assessment of schools, focusing on fifth and eleventh graders. The school was considered the unit of measurement; that is, data were not reported on either individual students or classrooms or for the school district as a whole. Students responded to instruments designed to measure performance in the Ten Goals of Quality Education. These goals, adopted by the State Board of Education, are shown in Table 1.

In addition to the items designed to measure pupil performance on the ten goals, students answered questions about their family backgrounds, their interests and the accessibility of school resources. Teachers anonymously completed a questionnaire designed to assess their backgrounds, classroom practices and attitudes. Building administrators provided data about school and community characteristics. In total, these condition variables provide information for eight student background variables, four community variables and 27 school staff characteristics. The data from these different sources were merged in order to develop a status profile report for each school involved in the assessment.

TABLE 1

PENNSYLVANIA'S TEN GOALS OF QUALITY EDUCATION

	Quality Education should:
I	Help every child acquire the greatest possible understanding of himself or herself and appreciation of his or her worthiness as a member of society.
II	Help every child acquire understanding and appreciation of persons belonging to other social, cultural and ethnic groups.
III	Help every child acquire, to the fullest possible extent, mastery of the basic skills in the use of words and numbers.
IV	Help every child acquire a positive attitude toward the learning process.
V	Help every child acquire the habits and attitudes associated with responsible citizenship.
VI	Help every child acquire good health habits and an understanding of the conditions necessary for maintaining of physical and emotional well-being.
VII	Give every child opportunity and encouragement to be creative in one or more fields of endeavor.
VIII	Help every child understand the opportunities open to him or her to prepare for a productive life and help each child to take full advantage of these opportunities.
IX	Help every child to understand and appreciate as much as possible of human achievement in the natural sciences, the social sciences and the humanities and the arts.
X	Help every child to prepare for a world of rapid change and unforeseeable demands in which continuing education throughout adult life should be a normal expectation.

Data contained in the status profile report were used to compare teacher, administrator and student background information gathered from the individual school with the teacher, administrator and student background information gathered from other schools within the state, and to compare the individual school with all other schools in Pennsylvania in every goal area. The report also included a predicted range of scores for each goal. (The prediction process was developed by correlating student mean scores with the indicator data and submitting the resultant correlations to regression analysis.) Therefore, school officials could compare their schools to other schools operating under similar conditions. In order to avoid misinterpretation of the data collected, a representative of the Department of Education delivered the school report to the superintendent and his staff and provided an interpretation of each school's results within the district. (For a full report of the Pennsylvania program see William Burson, Educational Quality Assessment: The First Six Years, Pennsylvania Department of Education, Harrisburg, Pennsylvania.)

Most Pennsylvania school districts have now participated in this program (see Table 2). Data from 1970-71 are not included due to format problems on the data tapes.

Measures Used in Assessing Student Performance

The school report contains data which relate each of the inputs to all output measures, but discussion here will be restricted to three cognitive and three noncognitive (affective) measures. The cognitive measures are Basic Skills-Verbal, Basic Skills-Math and Vocational Development. The noncognitive measures are Attitude Toward School and

TABLE 2

NUMBER OF SCHOOLS BY YEAR

Year	Schools				
	5th	7th	8th	9th	11th
1969-70	353				73
1971-72	172				53
1972-73	382	63		148	90
1973-74	785		240		191

Learning, Citizenship and Self-Understanding. The instruments used in the 1973-74 assessment of grades five, eight and eleven do differ slightly from those used to assess the fifth and eleventh grades between 1969 and 1973 and the seventh and ninth grades in 1972-73. Although the measurement instruments differ somewhat between grade levels, the rationales did not change substantially.

Basic Skills-Verbal

The Basic Skills-Verbal test and the Basic Skills-Math test are used in the Pennsylvania program in place of standardized achievement tests in order to reduce test administration time. The Basic Skills-Verbal measure, a 30-item verbal analogies test, correlated highly (.85+) with the Stanford Achievement Test and the Iowa Test of Basic Skills and serves as an effective proxy for the Language Arts sections of the standardized tests.

Basic Skills-Math

The 30 items in the Basic Skills-Math test measure knowledge of facts or rules, problem-solving, manipulation and analysis. The test contains few "modern mathematics" items and no business or interest problems. The test items do, however, sample mathematical skills and concepts with which all students should be familiar. As with the Basic Skills-Verbal test, the Basic Skills-Math test correlates highly with standardized achievement test scores.

Vocational Development

The Vocational Development instrument used to assess fifth graders contained 39 items designed to measure the students' attitude toward work, independence from parents making vocational decisions and the role

choice plays in occupational planning. The eleventh grade instrument contained 50 items designed to measure the same factors as those measured in the fifth grade instrument. The eleventh grade test, however, also included an attitude toward work scale in which helping others is the focal point. Scores obtained from these measures correlated significantly (0.60) with the Basic Skills measures.

Attitude Toward School and Learning

The Attitude Toward School and Learning instrument measures students' perceptions about teachers, school climate, homework and attitudes toward learning in general. The eleventh grade instrument contained 28 items; the fifth grade instrument 17 items.

Citizenship

Items included in the Citizenship instrument were designed to measure the students' attitudes toward personal responsibility, civil rights, honesty and personal initiative; items were not designed to measure students' knowledge of government, history, or law. Both the fifth and eleventh grade instruments contained 44 items.

Self-Understanding

The 53 items of the Self-Understanding instrument were designed to explore students' feelings of self-confidence, self-image in the school, relationship with others and confidence in the ability to fulfill ambitions.

Indicators

The legislation which gave impetus to the Pennsylvania Assessment Program required that procedures be developed to provide each school

district with relevant comparative data which would enable school directors and administrators to more readily appraise educational performance. In order to avert invidious comparison which might lead to discontent, animosity or envy, indicator information was collected to take into account those differences in school and community, instructional staff and students in a school that delimit what a school can accomplish with its students.

The first step in selecting indicators was a review of previous studies with emphasis upon the indicators used and relationships found between indicators and performance measures. Next, the availability of information and the cost of obtaining information were considered. For example, some data, such as instructional cost by school, are not available; therefore, instructional costs by districts were used instead. The instruments measure students' perceptions of their teachers, but they do not measure actual teacher performance. Although teacher variables, especially teacher classroom behaviors, have been found to be related to student performance, the cost of collecting classroom process data on a statewide basis was prohibitive. Indicators finally included were those which were hypothetically related to one or more goals, were readily available and could be collected economically. The indicators used are shown in Table 3. Also shown in the table is the source of the information, the quantification scheme and the index description.

Indicators Related to Student Performance in Pennsylvania

This section summarizes the relationships found between indicators and goals from three years of assessing fifth and eleventh grade students in Pennsylvania. Results are based on correlations computed from data

TABLE 3

SCHOOL AND COMMUNITY INDICES

VARIABLE NAME	MEASURE	WEIGHTING	INDEX DESCRIPTION
STAFFP (Staff: pupil ratio)	The number of personnel who spend at least one-half their time in instructional activity was divided by the total number of students in the school.		A higher value indicates more instructional personnel per pupil.
BOOKSP (Books: pupil ratio)	The number of library books available for student checkout was divided by the total number of pupils in the school.		A higher value indicates more library books available for each pupil.
INNOVATE (School innovation)	The school administrator reported the extent to which his school employed 12+ relatively new educational practices (e.g. individual study, nongraded classes, instructional TV).	5 = Use regularly 4 = Use occasionally 3 = Considered trying 2 = Don't agree 1 = Never tried	A higher score on this index indicates the school uses several innovative practices regularly and/or many of the practices at least occasionally.
LIBRARY (Accessibility of library)	Students were asked how often they were able to use the school library.	5 = Often as needed 4 = Frequently 3 = Several days a week 2 = Only when class is scheduled 1 = No library in school	A higher score on this index indicates that the school offers freer accessibility to its library resources.
SUBSIDY (School subsidy per WADM)	The state instructional subsidy paid to the school district was divided by the Weighted Average Daily Membership of the district. All schools participating from district were assigned this score.	Expressed in whole dollars paid in 1971-72	A higher value indicates that the school of interest is in a district which received more state funds to supplement its instructional activities.
INSEXADM (Instructional expenses per ADM)	The instructional expenses of the district were divided by the Average Daily Membership of the district. All schools participating from district were assigned this score.	Expressed in whole dollars paid in 1970-71	A higher value indicates that the school of interest is in a district which expends relatively more funds per pupil for instruction.
EFFORT (Tax Effort Index)	Budgeted school taxes for the district were divided by the market values. All schools participating from district were assigned this score.	Expressed in mills for 1971-72	A higher value indicates that the school of interest is in a district which has a greater willingness to tax itself for educational purposes.
ENROLL (School Enrollment)	The administrator reported the total school enrollment as of October 1 of a given year.		The number indicates the building enrollment.
LOCATION (Predicted achievement index by location)	Secondary students reported the type of community in which they were then living. Due to substantial misinterpretation of this item by 5th grade pupils in the normative study, the EQA staff assigned scores to elementary schools based upon knowledge of size and location of the communities from which the school drew its students. In subsequent school studies, elementary pupils were aided by the teacher in reporting their community type.	8 = Suburb of city (over 500,000) 7 = Suburb of city (100,000-500,000) 6 = Suburb of city (10,000-100,000) 5 = Inside city (10,000-100,000) 4 = Inside city (100,000-500,000) 3 = Inside town less than 10,000 2 = Inside city over 500,000 1 = Open country or farming community	A higher score on this index indicates that the school is drawing a larger proportion of its students from suburban rather than rural or urban areas.
INTERRAC (Interracial exposure)	Students reported whether or not they came in contact with students of a race different from their own in their classes or school activities.	2 = Yes 1 = No	A higher value on this index indicates greater interracial exposure in school.
HOUSING (Types of residences in school's community)	The school administrator reported the percentage of various types of housing units in the area served by the school.	6 = Expensive private homes 5 = High-rental apartments 4 = Moderate-priced homes 3 = Moderate-rental apartments 2 = Low-cost homes 1 = Low-rental apartments	A higher value on this index indicates that the school serves an area that has a relatively larger proportion of expensive private homes and/or apartments.

TABLE 3 (Continued)

INSTRUCTIONAL STAFF INDICES

VARIABLE NAME	MEASURE	WEIGHTING	INDEX DESCRIPTION
TMEDUC (Educational level of teacher's mother)	Sample teachers reported the highest level of formal education attained by their mother or female guardian.	9 = Completed Ph.D. or professional degree 8 = Some work toward Ph.D. or professional degree 7 = Masters degree 6 = Graduated, college 5 = Some post-high school 4 = Graduated, high school 3 = Some secondary 2 = Elementary 1 = No formal education	A higher value on this index indicates that the mothers of the school's instructional staff have attained a higher level of formal education.
TFOCC (Occupational level of teacher's father)	The sample teachers reported the occupational category of their father or principal wage earner while they were growing up.	9 = Professional; doctor, lawyer 8 = Accountant, or manager 7 = Teacher 6 = Owner of small business 5 = White-collar 4 = Farmer 3 = Skilled worker 2 = Semi-skilled worker 1 = Unskilled	A higher value on this index indicates that the school's instructional staff comes from backgrounds in which the family's principal wage earner tended to be professional or white-collar workers as opposed to semi-skilled or unskilled.
TLOCALE (Teacher locale)	Sample teachers reported where they graduated from high school.	5 = This town or immediate area 4 = In state but outside this town 3 = In another state 2 = In Puerto Rico or other U. S. possession 1 = In another country	A higher value on this index indicates that the school draws its instructional staff from the local area as opposed to other states or countries.
TCOLLEGE (Teacher's college)	Sample teachers reported whether or not they had earned a college degree and the type of college from which they graduated.	3 = Liberal arts college or university 2 = State college 1 = No degree	A higher score on this index indicates that more of the staff have degrees and are more likely to have attended a liberal arts college or university than a state college.
TEDUC* (Teacher's education)	The level of training of all teachers was obtained from the Professional Personnel Record.	9 = Doctor's degree 8 = Master's degree plus 2 years 7 = Master's degree plus 1 year 6 = Master's degree 5 = Bachelor's degree plus 1 year 4 = Bachelor's degree 3 = Three years of college 2 = Two years of college 1 = One year of college 0 = No college	A higher score on this index indicates that the school's instructional staff has a higher level of formal education.
TSTABL (Teacher stability)	Sample teachers reported the area in which they spent most of their lives.	Response alternatives and respective weightings were identical to TLOCALE.	A higher value on this index indicates that the school's instructional staff have spent most their lives in the immediate area as opposed to other states or countries.
TAGE (Teacher's age)	Each sample teacher indicated his age by checking one of nine 5-year age categories.	9 = 60 or over 8 = 55-59 7 = 50-54 6 = 45-49 5 = 40-44 4 = 35-39 3 = 30-34 2 = 25-29 1 = 20-24	This index reflects the mean age, by categories, of a school's instructional staff.
TSEX* (Teacher sex)	The sex of each teacher was obtained as reported in the Professional Personnel Record.	2 = Female 1 = Male	A higher value on this index represents a higher proportion of female teachers within the school.
TEXPER* (Teacher experience)	The total years of service in education was obtained for each teacher from the Professional Personnel Record.		This number represents the mean educational experience, in years, of the school's instructional staff.

* Collected for all teachers in the school.

TABLE 3 (Continued)

INSTRUCTIONAL STAFF INDICES (continued)

VARIABLE NAME	MEASURE	WEIGHTING	INDEX DESCRIPTION
TPPOS (Teacher present position)	Each sample teacher reported the number of years he had completed in his present position.	8 = 20 or more years 7 = 16-20 years 6 = 11-15 years 5 = 6-10 years 4 = 3-5 years 3 = 2 years 2 = 1 year 1 = Less than 1 year	This index reflects the degree to which a school's instructional staff have remained in their present positions.
TSALARY* (Teacher salary)	The salary for each teacher was obtained from the Professional Personnel Record.		This value represents the mean salary for a school's instructional staff.
TSATIS (Teacher satisfaction)	Each sample teacher responded to a 6-item questionnaire which was scaled to reflect the degree of his satisfaction with his role in the school. (Example: "I find my job exciting and rewarding.")	5 = Almost always 4 = Frequently 3 = Sometimes 2 = Infrequently 1 = Almost never	A higher value on this index indicates a greater degree of job satisfaction of the school's instructional staff.
CLPRACT (Teacher classroom practices)	Each sample teacher reported the extent to which he employed 11 "innovative" classroom practices (e.g., pupil participation in lesson planning).	5 = Use regularly 4 = Use occasionally 3 = Considered its use 2 = Never use 1 = Don't agree with practice	The value on this index indicates the extent to which relatively innovative classroom practices are employed by the sample teachers.
REACTL (Perception of actual characteristics influencing professional recognition)	From a list of 7 characteristics, the sample teacher chose the one he felt was *actually* most important in gaining professional recognition in his school district.	7 = Rapport with central office 6 = Rapport with immediate supervisor 5 = Formal education 4 = Seniority 3 = Imaginativeness 2 = Dependability 1 = Quality and quantity of work	A higher value on this index indicates that the instructional staff perceives professional recognition to be achieved through personal relationships as opposed to quality and quantity of work completed.
RECIDEA (Perception of "ideal" characteristics influencing professional recognition)	From a list of 7 characteristics, sample teachers chose the one they felt should *ideally* be most important in gaining professional recognition in their school district.	Same codes were used as for REACTL.	A higher value on this index indicates that the instructional staff feels that ideally professional recognition is obtained through personal relationships as opposed to quality and quantity of work completed.
TCAREER (Teacher career)	Sample teachers selected from ten choices what they would like to be doing five years from now.	10 = Will be retired 9 = Teacher 8 = Special services 7 = Research worker 6 = Guidance 5 = Curriculum director 4 = Principal 3 = Administrator in central office 2 = Superintendent 1 = Out of education	A higher score on this index indicates that the career aspirations of the instructional staff tend toward classroom involvement.
DISCREP (Discrepancy)	Sample teachers rated the relative influence 14 groups (superintendent, parents, teachers, etc.) had on the educational process. They then rated the *ideal* influence of each of those groups. For each of the 14 groups a real-ideal discrepancy was computed. A total discrepancy score was obtained: $D = \sqrt{\Sigma d^2}$	5 = Great deal 4 = Considerable 3 = Some 2 = Little 1 = None	A higher discrepancy score indicates a greater disparity between what the instructional staff sees as the actual and the ideal influences various groups have in determining educational matters in the school.

* Collected for *all* teachers in the school.

TABLE 3 (Continued)

STUDENT INDICES

VARIABLE NAME	MEASURE	WEIGHTING	INDEX DESCRIPTION
FOCC (Father's occupation)	The sample 11th grade student reported his father's occupation from a list of 143 possible occupations. On the elementary level the student's teacher completed this item.	The occupational categories were weighted from 0 to 96 according to a combination of education needed to secure the occupation and income derived from the occupation.	A higher value on this index indicates that the school tends to draw a large proportion of its students from homes where the fathers are employed in higher-paying jobs requiring a higher educational level.
MOCC (Mother's occupation)	The sample 11th grade student reported his mother's occupation from a list of 143 possible occupations. On the elementary level the student's teacher completed this item.	Using mothers who were gainfully employed (i.e., excluding housewives, mothers in school, pensioned, or deceased), a mean was calculated for each sample school. Weights applied were identical to those used in FOCC.	A school high on this index draws a greater proportion of its students from homes in which the working mothers are more likely to be employed in higher-paying jobs and/or jobs requiring a higher educational level.
PCTMW (Percentage of mothers working)	From the sample student's report of MOCC, the percentage of working mothers was calculated.		This score reflects the percentage of working mothers.
FAMSES (Family socioeconomic status)	The family socioeconomic status for a school was calculated by the formula: $\frac{(\Sigma \text{ FOCC for } n_1 \text{ fathers} + \Sigma \text{ MOCC for } n_2 \text{ mothers})}{\text{greater of } n_1 \text{ and } n_2}$		This index is a composite of MOCC and FOCC levels of the school.
MORESB (Mores—Boys)	The sample student reported, from a list of 5 qualities, his perception of the single best way for a boy to be important or looked up to by other students in his school.	5 = Being bright, well-informed, interesting 4 = Doing well in school 3 = Being attractive, fun 2 = Being athletic star 1 = Coming from the right family	A higher score on this index indicates that students perceive intellectual factors as relatively more important than social factors or athletics in determining a boy's popularity.
MORESG (Mores—Girls)	The sample student reported, from a list of 5 qualities, his perception of the single best way for a girl to be important or looked up to by other students in his school.	5 = Being bright, well-informed, interesting 4 = Doing well in school 3 = Being attractive, fun 2 = Being a cheerleader 1 = Coming from the right family	A higher score on this index indicates the student body of the school tends to perceive intellectual factors as relatively more important than social factors in determining a girl's popularity.
VALUES (Personal values)	From a list of the same 5 qualities as MORESB and MORESG, the sample student reported that quality which was most important to him personally regardless of what others may choose.	5 = Being bright, well-informed, interesting 4 = Doing well in school 3 = Being attractive, fun 2 = Being athletic star or cheerleader 1 = Coming from the right family	A higher score on this index indicates that the members of the student body tend to perceive intellectual pursuits as more productive in gaining peer group recognition than social status factors.
OCDESIRE (Occupational desires)	From the same list of 143 occupations used for FOCC and MOCC, the sample student reported the occupation he desires to follow.	The weightings employed were identical to those used for FOCC.	This index indicates the mean occupational level the students desire to attain.
OCEXPECT (Occupational expectation)	From the same list as OCDESIRE, the sample student reported the occupation he expects to follow.	The weightings were identical to those used for FOCC.	This index indicates the mean occupational level the students expect to attain.
SEX (Sex of students)	The sample student reported his or her sex.	2 = Female 1 = Male	A higher value on this index represents a higher proportion of female students.
RACE (Predicted achievement index by race)	From a list of six ethnic and racial categories each sample student chose the category that best described him.	6 = Oriental 5 = White 4 = American Indian 3 = Puerto Rican 2 = Black 1 = Other	This variable was scaled in such a way that the index is a predicted-achievement index by racial composition. Weights were assigned on the basis of the groups' rank-order achieved scores as reported by Coleman.
ATTEND (Attendance)	The sample student reported the number of days he was absent during the past school year.	5 = None 4 = 1-5 days 3 = 6-10 days 2 = 11-15 days 1 = 16 or more days	A higher value on this index represents a greater degree of student attendance within the school.

TABLE 3 (Continued)

INDICATORS FROM SEVENTH/NINTH GRADE AND 1974 ASSESSMENT

HOMECLIM (Home climate)	The students reported their opinions on 8 items about home conditions.	Very much like me Usually like me Usually unlike me Very much unlike me Range: 0-24	A higher value indicates that the students have more favorable attitudes toward their home conditions.
PARATT (Parental attitude toward school)	The students reported their opinions on three items: (1) My parents enjoy hearing about school (2) My parents feel the school is doing a good job (3) My parents support what the school does.	3 = Almost always 2 = Usually 1 = Sometimes 0 = Almost never Range: 0-9	A higher value indicates that the students felt their parents have a greater interest in the school, a higher opinion of the work of the work of the school, and greater support of the school.
PERSAD (Teacher perception of school administration)	The teachers responded to 7 items concerning their feelings about the school administration.	4 = Always true 3 = Usually true 2 = Sometimes true 1 = Seldom true 0 = Never true Range: 0-28	A higher value on this index indicates a more positive attitude of the school's teaching staff toward the school administration.
PERLERAT (Teacher perception of learning atmosphere)	The teachers indicated whether each of 21 school problems constituted a problem in their school.	1 = No 2 = Yes Range: 0-21	A higher value indicates a positive learning atmosphere, that teachers feel fewer of the listed problems affect their school.
TSATPAR **TSATFS** **TSATPRIN** **TSATST** (Teacher satisfaction with relationships with:) 1) Parents 2) Staff 3) Principal 4) Students	The teachers reported how satisfied they were with their relationships with: Parents and parent groups Fellow staff members School principal Students	4 = Very satisfied 3 = Somewhat satisfied 2 = Somewhat dissatisfied 1 = Very dissatisfied	A higher value on any of these indicies indicates that the teaching staff of the school is more satisfied with its relationships with that group.

collected in the 1969-70, 1971-72 and 1972-73 assessments of the fifth and eleventh grades. If significant relationships were not observed at either the fifth or eleventh grade in at least two of the three years, the goal is not listed in this summary. For each indicator that correlated significantly with a goal score in at least two of the three years, the following information will be provided:

Measurement: How the indicator was quantified for the Pennsylvania assessment.

Source: Where the data were obtained. When the several sources are listed, the first is the primary source used by the Pennsylvania Department of Education. Data, however, were obtained from the other listed sources as well.

Relationships Observed:

S+ = A significant positive relationship at least two of the three years between the indicator and the goal shown, i.e., as indicator values increase, the goal scores tend to increase.

S- = A significant negative relationship at least two of the three years between the indicator and the goal shown, i.e., as scores on one measure increase, scores on the other tend to decrease.

ns = No significant relationship was observed in at least two of the three correlations.

Comments will be offered in order to elaborate on relationships or to provide words of caution about the interpretation of the relationships.

Indicator: Instructional Expense Per Average Daily Membership

Measurement: Instructional expenses of the district were divided by the average daily membership of the district.

Source: State department records, school district files

Relationships Observed:

	5th	11th
Self-Understanding	ns	S+
Vocational Development	ns	S+

Discussion: Instructional expense, as used here, accounts for only the monies spent for instruction; it does not include monies spent for transportation, cafeteria, capital outlay, debt service, etc. Usually the highest amounts for instructional expenses are found in higher socioeconomic status (SES) districts. These data indicate that the amount of monies expended has little impact on scores at the elementary level and only a moderate effect at the secondary level.

Many other studies have used some measure of instructional expense, but few have reported significant cognitive relationships at either the elementary or secondary levels. The difference in findings may be attributed to the fact that other studies, unlike the Pennsylvania study, employed a broader definition of the term "instructional expense," including all monies spent by the school and not just monies spent for instructional purposes. If, as this study indicates, instructional

expenses do make a difference, then schools must determine desired outcomes and determine which economic resources can best lead to the achievement of priority outcomes.

Indicator: Subsidy

Measurement: State instructional subsidy paid to the school district was divided by the weighted average daily membership of the school district and expressed in whole dollars.

Source: State department records, school district files

Relationships Observed:

	5th	11th
Self-Understanding	S-	S-
Citizenship	ns	S+
Basic Skills-Verbal	S-	S-
Basic Skills-Mathematics	S-	S-
Vocational Development	S-	S-

Discussion: The Pennsylvania subsidy formula is such that poorer school districts receive greater amounts of subsidy. These data clearly show that state monies are going to schools where performance is low in cognitive measures and Self-Understanding. An examination of the data bank, however, revealed that schools receiving greater amounts of subsidy still do not spend as much money on instructional costs per pupil as do schools receiving smaller amounts of subsidy. That is, poorer districts still are not able to spend as much for their students as do the "richer"

districts. For example, in Pennsylvania, schools classified as low socioeconomically received, on the average, 64 dollars more than high socioeconomic schools, but those classified as high, spend on the average, 30 dollars more on instructional costs per student.

Because subsidy formulas differ from state to state, no comparisons may be made with studies conducted by other states. The Pennsylvania data indicate that the state subsidizes more heavily districts that have greater deficiencies in their academic achievement. It is apparent that existing state subsidies alone do not enable these districts to overcome their deficiencies. This conclusion raises questions for further study. Would a greater state subsidy to low socioeconomic schools reduce deficiencies in academic achievement by equalizing the actual monies spent on instructional costs per student or are these deficiencies the result of broader socioeconomic variables which school subsidies alone could not change?

Indicator: School Attendance

Measurement: Students responded to one of five categories which best indicated the number of days they were absent the past school year.

Source: Students, school records, state department records

Relationships Observed:	5th	11th
Basic Skills-Verbal	ns	S+
Basic Skills-Mathematics	ns	S+
Attitude Toward School and Learning	ns	S+
Citizenship	ns	S+

Discussion: These data indicate that school attendance is not related to elementary student performance. In secondary schools where the attendance rate is high, one would likely find students who are successful in the cognitive areas and indicate a liking for school and learning. These students also indicate a high degree of responsibility, honesty and integrity. These are mutually reinforcing variables; that is, higher attendance is associated with a responsible attitude, a liking for school and an indication of success in a school environment. The discrepancy between fifth and eleventh grade scores may suggest that those students who have little interest in school and learning and who have not been able to master the basic verbal and mathematical skills, have been removed from the school rosters by grade eleven. It is more probable, however, that the lack of a significant relationship at grade five is a result of the low variability in attendance at this grade level.

Indicator: School Innovation

Measurement: The school administrator reported, on a five-point scale, the extent to which his school employed 12 relatively new educational practices selected by the Department of Education.

Source: School administrators, teachers, intermediate units, state departments

Relationships Observed:

	5th	11th
Attitude Toward School and Learning	S+	ns

Discussion: The low impact of school innovation on either the cognitive or noncognitive domain is initially surprising. An examination of the responses made by administrators reveals that few of the innovations are used regularly, many only occasionally. It appears that innovations are considered and discussed by administrators at both the fifth and eleventh grade levels, but few are implemented. The one significant relationship observed indicated that school attitudes of fifth graders are more positive where there is greater application of innovative practices. It may be that innovations applied in elementary schools are not as subject to dilution as when applied in secondary schools. Because the elementary teacher can control a larger block of school time than the secondary teacher, there is a greater possibility that the innovation will create a positive response.

The indicator of innovation used in the Pennsylvania Assessment Program does not provide information about the

impact of any one innovation on school outcomes, nor does it attempt to measure the impact of innovative practices which may have been initiated by the school but were not included in the list provided in the measurement.

Much of the literature on innovation deals with the effect of a particular innovation on educational outcomes. While it is important for the policy maker to know how well an innovation works, the public should examine the openness of the school toward innovations, e.g., does the school have effective procedures to review the extent to which it is meeting student needs and the mechanisms to adopt new practices if needs are not being met?

Indicator: Accessibility to the School Library

Measurement: Students responded to a five-point scale to indicate how often they were able to use the school library.

Source: Students, library records

Relationships Observed:

	5th	11th
Basic Skills-Verbal	S+	ns
Attitude Toward School and Learning	S+	S+
Citizenship	ns	S+
Vocational Development	S+	S+

Discussion: It appears that in elementary schools where the library is open to the students, students show better attitudes toward school and greater verbal skills. One must be

especially careful not to infer any cause-effect relationships. This indicator may be a proxy socioeconomic variable, i.e., there may be less stress on student control in high socioeconomic schools; low socioeconomic schools, on the other hand, may be more inclined toward discipline and rigid scheduling which would tend to decrease accessibility to the library. This indicator, therefore, may be a proxy for school openness; the more open the school, the better the attitude toward school.

Indicator: Accessibility to the Counselor (eleventh grade only)

Measurement: Students responded to a five-point scale to indicate how often they were able to talk with the school guidance counselor about a concern.

Source: Students

Relationships Observed:	11th
Attitude Toward School and Learning	S+
Citizenship	S+

Discussion: This measure is concerned only with accessibility; it is not concerned with the issue of the quality of counseling received by the students. In this sense then, it is a measure of the availability of the school guidance counselors to the students. In schools where students perceive free access to the school guidance counselor, students' attitudes toward the school are better, and students reported more responsibility, honesty and integrity.

Many studies have used the ratio of counselors to students rather than accessibility. There appears to be some consensus of findings; higher ratios are associated with higher achievement in cognitive achievement. Number of counselors and their accessibility can be controlled by the school. Therefore, it may be possible for the school to improve both cognitive and noncognitive achievement by increasing both counselor ratio and counselor accessibility.

Indicator: Teacher Education

Measurement: These data were obtained from State Department of Education records which record the level of training of all teachers on a nine-point scale.

Source: State department records, school records, teachers

Relationships Observed:

	5th	11th
Self-Understanding	ns	S+
Basic Skills-Verbal	ns	S+

Discussion: Although teacher education appears to be more important at the higher grade levels, there is not sufficient information to delineate the effect of teacher education upon the students. One cannot say that the increase in scores was due to the higher level of teacher education, or whether the better-trained teachers seek out schools where students have better self-understandings and perform better in basic skills areas.

Other studies have used per cent of teachers with masters' degrees, teacher verbal ability, or recentness of educational experience as an indicator. While the results are mixed, it appears that both the teacher's verbal ability and recentness of educational experiences such as workshops and inservice training may be more important than years of formal education.

Indicator: Teacher's Salary

Measurement: The actual teacher salary was obtained from Department of Education records.

Source: State department records, school records, teachers

Relationships Observed:

	5th	11th
Self-Understanding	S+	S+
Basic Skills-Verbal	ns	S+
Basic Skills-Mathematics	S+	S+
Vocational Development	ns	S+

Discussion: Other studies have also found teacher salaries related to cognitive achievement, but few studies have correlated salaries with noncognitive measures. It would be a dangerous generalization, however, to conclude from this data that higher teacher salaries will produce greater Self-Understanding and cognitive achievement among students. Teacher salaries are often a reflection of the school district location and the socioeconomic

situation of the community; the higher Self-Understanding and Basic Skills associated with the teacher salaries, therefore, may be more a reflection of the location of schools than anything else. One usually finds higher salary scales in suburban districts than in rural districts; likewise, one usually finds higher student scores in both Self-Understanding and the cognitive measures in suburban districts than in rural districts.

One must bear in mind that teacher salaries are often based on the teacher's education level and years of experience. A higher salary may occur because of higher salary schedule, high educational level, or many years of experience. (Whether salaries purchase more than these qualities is not known.)

Indicator: Teacher Classroom Practices

Measurement: Teachers responded to a five-point scale and reported the extent to which they employed 11 "innovative" classroom practices.

Source: Teachers, students

Relationships Observed:	5th	11th
Vocational Development	S+	ns

Discussion: These data indicate that very few significant relationships exist between more flexible classroom practices and achievement in the areas being examined. Examination of the data reveals that more innovative classroom practices

are found in schools where the teachers are better paid, have more formal education and indicate more satisfaction in their teaching situation. It should also be noted that few practices were used regularly; most teachers reported they used the practices occasionally or had just considered using them. Obviously, if a "new practice" is not used with some regularity, it is not likely to make any significant difference in student performance.

Indicator: Teacher's College

Measurement: Teachers reported whether or not they had earned a college degree and the type of college from which they had been graduated.

Source: Teachers, school records

Relationships Observed:	5th	11th
Self-Understanding	ns	S+

Discussion: In schools with more teachers from universities or liberal arts colleges, the eleventh graders scored higher on the Self-Understanding measure. These findings may indicate only that university or liberal arts college graduates are attracted to schools where students have higher self-understandings. The data are not sufficient to imply that university or liberal arts college graduates foster better self-understandings in their students than do graduates from teacher colleges.

This indicator has been used in a few studies in which significant relationships have been observed with both cognitive and noncognitive measures. Although there appears to be little difference between the approach to teaching recommended by universities and liberal arts colleges and that recommended by teacher colleges, there is some evidence that students electing to attend teacher colleges have different personality traits than those choosing liberal arts colleges or universities. These differences, rather than the college programs, may be influencing the observed results.

Indicator: Education of Teacher's Mother

Measurement: Teachers reported the highest level of formal education attained by their mother or female guardian.

Source: Teachers

Relationships Observed:

	5th	11th
Basic Skills-Mathematics	ns	S+

Discussion: Because the researchers believed that the background of the teacher might influence the way in which the teacher related to students, two variables designed to gather information about the socioeconomic background of the teacher were included in the assessment model. From these data it appears, however, that the background of the teacher has little impact on the goals measured. It

should also be pointed out, however, that teachers whose mothers had a higher level of education tend to teach in higher socioeconomic settings. It may be that the background of the teacher is a factor which influences the teacher's choice of location and, therefore, reduces the number of situations in which teachers instruct students having a background different from their own.

Indicator: Occupation of Teacher's Father

Measurement: Teachers reported the occupational category of their father or principal wage earner while they were growing up.

Source: Teachers

Relationships Observed:

	5th	11th
Self-Understanding	S+	ns
Basic Skills-Verbal	S+	ns
Basic Skills-Mathematics	S+	ns
Vocational Development	S+	S+

Discussion: The pattern of relationships observed for this indicator for fifth grade is similar to that observed for student's Father's Occupation. Upon examination, one discovers that Occupation of Teacher's Father scores are positively related to student's Father Occupation scores. Teachers tend to be employed in schools where the SES background of their students is similar to the status teachers had as students.

Indicator: Teacher Sex

Measurement: The sex of each teacher was obtained from Department records; coded 1 for males, 2 for females.

Source: Department records, school records, teachers

Relationships Observed:	5th	11th
Vocational Development	S+	ns

Discussion: The sexual composition of faculties appears to have little bearing on achievement. This is not to say that individual students might not react differently to a male or female teacher, but that the ratio of males to females on a faculty has little relationship to achievement.

Indicator: Occupation of Student's Father/Mother

Measurement: Students reported occupations of their fathers and mothers from a list of 143 occupations which had been weighted from 0 to 96. The weights were based on education needed to secure the occupation and income derived from the occupation. Data for fifth grade were obtained from student records; eleventh graders reported the information about their parents.

Source: Students, census data, school records

Relationships Observed:	5th	11th
Self-Understanding	S+	S+
Citizenship	S+	S-
Basic Skills-Verbal	S+	S+
Basic Skills-Mathematics	S+	S+
Vocational Development	S+	S+

Discussion: In almost every case the same pattern of relationships existed between mother's occupation, father's occupation and the goal scores; but also, in every case, the relationships were not as strong for mother's occupation and the goal scores as they were for father's occupation and the goal scores. These findings are similar to those of many other surveys with respect to the cognitive areas. High socioeconomic status appears to foster positive self-images in the students and to influence high achievement in the Basic Skills.

It seems that high socioeconomic status may also induce or be associated with some conflict in the development of Citizenship attributes. The items in the Citizenship instrument reflect long-held beliefs about honesty, integrity and responsibility. The negative relationship between Citizenship scores and high socioeconomic status may be indicative of a changing value system in current society. High socioeconomic eleventh graders may not subscribe to these values as strongly as low-economic eleventh graders.

It is noteworthy that no relationships appeared between occupational status and Attitude Toward School and Learning.

There seems to be little doubt that occupational status of students' parents influences students' achievement. One must keep in mind that this is an aggregate effect; one cannot predict the individual student's scores solely on his parents' occupational status. Schools apparently react to the proportion of students whose parents are of a particular occupational status. When that status is high, the schools are likely to emphasize cognitive achievement; it is not clear what is emphasized when the status is low. Busing to achieve socioeconomic balance, therefore, might be more beneficial to student achievement than busing for racial balance.

Indicator: Types of Residences in the School's Community

Measurement: The school administrator reported the percentage of six types of housing units, from expensive private homes to low-rental apartments, in the area served by the school.

Source: School administrator, realtors, census data

Relationships Observed:

	5th	11th
Self-Understanding	S+	S+
Basic Skills-Verbal	S+	S+
Basic Skills-Mathematics	S+	S+
Vocational Development	S+	S+

Discussion: This indicator serves as both an economic and a social measure since housing developments are usually homogeneous with respect to cost, and persons occupying particular types of housing tend to share many beliefs and attitudes. These findings show that students from higher cost housing do better on cognitive measures, have more mature attitudes about the world of work and display better attitudes toward themselves.

Pennsylvania's method of quantifying this variable differs from the scheme used in other studies in that Pennsylvania's definition of housing values was more flexible; the actual monetary value assigned to high or low cost housing was based on the standard of the community rather than on a fixed scale. The results are similar, however, no matter which quantification scheme is used. One may expect to find high cognitive achievement and greater Self-Understanding among children in schools drawing students from high cost housing.

Indicator: Location (Predicted achievement index by location)

Measurement: Weights were assigned, based on prior studies which correlated basic skills scores and type of community, as follows:

(1) Open country or farming community

(2) Inside city (over 500,000)

(3) Inside town (less than 10,000)

(4) Inside city (100,000 - 500,000)

(5) Inside city (10,000 - 100,000)

(6) Suburb of city (10,000 - 100,000)

(7) Suburb of city (100,000 - 500,000)

(8) Suburb of city (over 500,000)

Source: Students, student records, census information

Relationships Observed:

	5th	11th
Self-Understanding	S+	S+
Basic Skills-Verbal	S+	S+
Vocational Development	S+	ns
Citizenship	ns	S-

Discussion: Location, as quantified here, is a proxy measure for group or aggregate socioeconomic status. Suburban students, in general, have a higher socioeconomic status than do inner city or rural students. The suburban students are likely to find the school and home mutually reinforcing with respect to verbal usage; reinforcement of verbal skills is less likely to occur for rural or urban students. Likewise, students in the suburban schools feel better about themselves, their sense of control over what happens to them, their relationship with others and their role in school than do either the rural or urban students.

Suburban fifth graders indicate a better understanding of the world of work than do rural or urban fifth graders. This may be due to their parents' status and degree of success in the world of work and to the fact that suburban students are exposed to more types of work

at the higher socioeconomic level than either rural or urban students.

The negative relationship between Citizenship scores and location, like the negative relationship between Citizenship scores and high socioeconomic status, may be indicative of a changing value system in current society. Suburban eleventh graders may not subscribe to long-held beliefs about honesty, integrity and responsibility as strongly as rural and urban eleventh graders.

Other studies have also defined location as urban, suburban or rural or degree of urbanism; meaningful comparisons between these studies and Pennsylvania's cannot be drawn, however, because the quantification schemes differ. Although suburban schools do tend to be of a higher quality, it does not automatically follow that schools located in a rural or urban setting will be of a poorer quality. Location is more an indicator of the types of people drawn to a certain environment than an indicator of school quality.

Indicator: Sex of Students

Measurement: Values were assigned: 1 for boy, 2 for girl

Source: Students, student records

Relationships Observed:

	5th	11th
Attitude Toward School and Learning	S+	ns
Citizenship	S+	ns

Discussion: Fifth grade girls indicate a more positive Attitude Toward School and Learning and Citizenship than do boys. These differences were not observed at the higher grade levels. These findings lend some support to the position that elementary schools are more oriented to girls than boys. If elementary schools tend to be more supportive of traits associated with girls, girls would display more favorable attitudes toward the school. Girls in fifth grade tend to respond more favorably than boys on the Citizenship measure. It may be that girls at this age are less rebellious than boys and try to please adults by conforming more to adult values.

Although sex of the student has been reported to be related to reading achievement, sex was not related to cognitive achievement as measured in the Pennsylvania Assessment Program.

Indicator: Race (Predicted achievement index by race or per cent White)

Measurement: Weights were assigned for fifth and eleventh graders, based on prior studies which correlated basic skills scores and race, as follows:

(1) Other
(2) Black
(3) Puerto Rican
(4) American Indian
(5) White
(6) Oriental

Source: Students, student records

Relationships Observed:	5th	11th
Self-Understanding	S+	ns
Attitude Toward School and Learning	ns	ns
Citizenship	S+	S+
Basic Skills-Verbal	S+	ns
Basic Skills-Mathematics	S+	ns
Vocational Development	S+	ns

Discussion: Approximately 85 per cent of the students responding were white; about 9 per cent were black; the remaining groups comprised about 6 per cent of the sample. The Pennsylvania data indicate that race becomes less a factor in school achievement as the student moves through the school system, but it must also be pointed out that few schools were racially balanced. One must be cautious, therefore, for the restricted variability in the race indicator for eleventh grade may account for the absence of significant correlations.

Indicator: Continuing Education (eleventh grade only)

Measurement: This measurement was based on the percentage of graduates who continue their education in college, vocational, technical, nursing or business school.

Source: State department records, school district files

Relationships Observed:		11th
	Self-Understanding	S+
	Basic Skills-Verbal	S+
	Basic Skills-Mathematics	S+
	Vocational Development	S+

Discussion: It is interesting to note the significant relationships with the cognitive measures and Self-Understanding and the absence of any relationship with Attitude Toward School and Learning or Citizenship. Perhaps students continue their education partly because they have been successful in school, have confidence in themselves and realize the benefits of more education in the world of work.

Although the typical Pennsylvania high school could expect about 51 per cent of its graduates to engage in some type of formal education program after high school, continuing education is strongly related to socioeconomic measures. Students from higher socioeconomic backgrounds have both the necessary funds and the social conditioning to make continuing education desirable. Whether the desire for schooling after high school is an outgrowth of schools' programs or students' backgrounds, or some combination of these two elements, remains to be determined.

Indicator: Holding Power of the School (eleventh grade only)

Measurement: To compute this measurement, the formula (graduating class + transfers - new students) was divided by enrollment of the same class at the beginning of the tenth grade. Often the inverse of this indicator is labeled "dropout rate."

Source: School records, state department records, intermediate unit records

Relationships Observed:

	11th
Basic Skills-Verbal	S+

Discussion: This result suggests that as the dropout rate decreases, verbal scores increase. This is contrary to what might be expected since potential dropouts tend to have lower verbal scores and their remaining in school would tend to lower the average verbal score for the school. It may be argued that mastery of verbal skills is the key to success in school since schools with high holding power tend to be in areas where the emphasis on cognitive achievement is high. Likewise, schools with high dropout rates (low holding power) tend to be in areas where basic skills scores are low. Even though the poorest students may quit school before graduation, the average basic skills scores of those remaining in the school continues to be low. Holding power, therefore, may be indicative of the socioeconomic status of the school. Students do not always elect to leave school, however, because they have not been able to master basic skills; they may drop out because the

school program does not provide relevancy or challenge. More importantly, then, high holding power may be an implicit vote of confidence by students in their school.

Nonsignificant Indicators

The indicators discussed thus far were significantly related to the student performance measure in at least two of the three years when assessment was carried out. Many variables used in this time period were originally hypothesized to be related to the student performance measure; however, analyses did not reveal significant relationships. As weighted for the Pennsylvania Assessment Program, the indicators listed in Table 4 did not correlate significantly with any of the six performance measures in at least two of the three years mentioned.

TABLE 4

INDICATORS NOT RELATED TO STUDENT OUTCOMES*
FOR 5TH AND 11TH GRADES

Indicator	Measurement	Sources
Percentage of Mothers Working	From the student's report of mother's occupation, the percentage of working mothers are calculated.	11th Graders' School Records
Teacher Age	Teachers indicated their age by checking one of nine 5-year age categories.	Department Records, Teachers
Teacher Present Position	Teachers reported the number of years they had completed in their present position.	Teachers
Teacher Locale	Teachers reported where they graduated from high school.	Teachers
Teacher Stability	Teachers reported the area in which they spent most of their lives.	Teachers
Teacher Perception of Actual Characteristics Influencing Professional Recognition	From a list of seven characteristics, the teachers chose the one they felt actually was most important in gaining professional recognition in their school district.	Teachers
Teacher Perception of "Ideal" Characteristic Influencing Professional Recognition	From a list of seven characteristics, teachers chose the one they felt should ideally be most important in gaining professional recognition in their school district.	Teachers
Teacher Career	Teachers selected from ten choices what they would like to be doing five years from now.	Teachers

TABLE 4 (Continued)

INDICATORS NOT RELATED TO STUDENT OUTCOMES*
FOR 5TH AND 11TH GRADES

Indicator	Measurement	Sources
Teacher Satisfaction	Teachers responded to a six-item questionnaire, which was scaled to reflect the degree of their satisfaction with their role in the school.	Teachers
Discrepancy	Teachers rated the relative influence 14 groups (superintendent, parents, teachers, etc.) had on the educational process. They then rated the ideal influence of those groups. For each of the 14 groups a real-ideal discrepancy was computed. A total discrepancy score was obtained.	Teachers
Tax Effort Index	Budgeted school taxes for the district were divided by the market values. All schools participating from district were assigned this score.	Department Records
Books-to-Pupil Ratio	The number of library books available for student checkout was divided by the total number of pupils in the school.	School Records
Staff-to-Pupil Ratio	Number of personnel who spent at least one-half their time in instructional activity was divided by total number of students in the school.	Department Records

*Were not correlated significantly for at least two of the three years for the six student outcome measures.

Additional Indicators: Pennsylvania's original plan for statewide assessment called for the assessment of grades one, three, seven and nine as well as grades five and eleven. Until 1973, however, the bulk of the testing was confined to fifth and eleventh graders. In the spring of 1973, representative samples of seventh and ninth graders were assessed. The format of the student performance measures used with these grades, particularly the Citizenship measure, differed somewhat from those used for fifth and eleventh graders, but the factors measured did not change. Those indicators used in the fifth and eleventh grade assessment which had proved to be redundant or which did not show significant correlations were dropped, and new ones were added.

In the fall of 1973, Pennsylvania adopted a new plan for assessment which called for the assessment of one-third of the state's school districts each year at three grade levels: fifth, eighth and eleventh. Some relationships observed in this assessment, carried out in 1974, are presented below. Eighth grade findings also reflect those relationships observed at grades seven and nine during the 1972-73 assessment.

Indicator: Parental Attitude Toward School as Perceived by Student

Measurement: Students responded to three items about how they perceived their parents' attitudes about the job the school is doing.

Source: Students, parents

Relationships Observed:	5th	8th	11th
Self-Understanding	S+	S+	S+
Basic Skills-Verbal	S+	S+	S+
Basic Skills-Mathematics	S+	S+	S+
Attitude Toward School and Learning	S+	S+	S+
Citizenship	S+	S+	S+
Vocational Development	S+	S+	S+

Discussion: It is apparent from the data that students do much better in school when they perceive their parents as being supportive of the school. This is perhaps due to some mutual reinforcement of the activities carried out in the school and those carried out in the home. Other studies have reported similar findings. That is, when the students feel there is a mutual support between the school and the home, they have better attitudes toward school and their achievement is greater.

Indicator: Home Climate

Measurement: Students reported their opinions on eight items about home conditions.

Source: Students, parents

Relationships Observed:	5th	8th	11th
Self-Understanding	S+	S+	S+
Basic Skills-Verbal	S+	S+	ns
Basic Skills-Mathematics	S+	S+	ns
Attitude Toward School and Learning	S+	S+	S+
Citizenship	S+	S+	S+
Vocational Development	S+	S+	S+

Discussion: This indicator, together with Parental Attitude Toward School as Perceived by Student, is especially valuable because it reveals the positive effect a good home life has on all the cognitive and noncognitive items measured. The results indicate that when students have good relationships with their parents, feel their parents understand them, and feel very comfortable in their home environment, they score high in the areas measured. This finding is especially important since the indicator is not related to any socioeconomic group; results were identical in both low and high socioeconomic areas. Because home life is such an influential factor in the outcomes desired by the schools, it may be desirable for more schools to introduce courses on the role of parents into the curriculums of both elementary and secondary schools.

Indicator: Teacher Perception of the Learning Atmosphere

Measurement: The teacher indicated by answering Yes or No to whether each of 21 school problems constituted a problem in their school.

Source: Teachers

Relationships Observed:	5th	8th	11th
Self-Understanding	S+	ns	ns
Basic Skills-Verbal	S+	S+	S+
Basic Skills-Mathematics	S+	S+	S+
Interest in School and Learning	ns	ns	S+
Citizenship	S+	ns	S+
Vocational Development	S+	ns	ns

Discussion: The problems covered in the 21 items include perceptions of both home and school problems. In schools where teachers perceive fewer problems, almost all the cognitive scores were higher. The absence of problems in schools is associated with better basic skills scores at all levels and positive Citizenship attitudes at grades five and eleven. While there is a moderate relationship of this indicator to socioeconomic status, it appears that, in schools where teachers feel there are fewer problems, the achievement of their students is higher. It is possible that greater time may be spent in teaching basic skills in a climate relatively free of problems.

Indicator: Teacher Satisfaction with the Students

Measurement: Teachers reported, on a four-point scale, how satisfied they were with the relationships with students.

Source: Teachers

Relationships Observed:	5th	8th	11th
Self-Understanding	S+	S+	S+
Basic Skills-Verbal	S+	S+	S+
Basic Skills-Mathematics	S+	S+	S+
Attitude Toward School and Learning	ns	S+	S+
Citizenship	S+	S+	ns
Vocational Development	S+	S+	S+

Discussion: Greater teacher satisfaction with students is associated with higher scores in almost every area at all levels. Teacher satisfaction may be a viable factor in influencing student achievement since increased scores in both cognitive and noncognitive areas appeared when teachers reported satisfaction with their students and their students' parents, had a good opinion of their school administrator and perceived fewer problems in their schools.

Indicator: Teacher Satisfaction with Relationships to Parents

Measurement: Teachers reported, on a four-point scale, how satisfied they were with relationships with parents.

Source: Teachers

Relationships Observed:	5th	8th	11th
Self-Understanding	S+	S+	ns
Basic Skills-Verbal	S+	S+	S+
Basic Skills-Mathematics	S+	S+	S+
Attitude Toward School and Learning	ns	ns	S+
Citizenship	S+	ns	S+
Vocational Development	S+	S+	S+

Discussion: An increase in satisfaction with relationships with parents expressed by teachers is associated with higher scores in the cognitive areas and self-understanding. Students who do well in the cognitive areas probably present fewer problems for teachers, thus leading to good relationships with parents.

There is some support from the literature that positive interactions between teachers and parents are associated with good learning climates. There appears to be wide consensus for strong school-community programs; the establishment of such programs may eventually aid student performance.

Indicator: Teacher Perception of the School Administration

Measurement: Teachers responded, on a five-point scale, to six items concerning their feelings about the school administration.

Source: Teachers

Relationships Observed:	5th	8th	11th
Basic Skills-Verbal	S+	S+	S+
Basic Skills-Mathematics	S+	S+	S+
Citizenship	S+	ns	S+
Attitude Toward School and Learning	ns	ns	S+

Discussion: Higher Basic Skills and Citizenship attitudes were associated with schools in which teachers perceived their administrators to be supportive. Other studies have shown that teachers tend to be more innovative when they perceive their administrators to be supportive, a tendency which may lead to better teaching and, ultimately, to better student performance.

Although the Pennsylvania Study has dealt chiefly with correlational relationships, there are other ways to look at indicators. One may, for example, identify trends by comparing school mean scores over a period of time. Since Pennsylvania has been assessing its schools since 1969, certain trends have become evident. These trends were particularly noticeable in the student outcome variables at grade eleven. For example, the Citizenship attitudes displayed by the eleventh graders in 1969 were considerably more positive than those displayed in 1972. Conversely, the self-concept attitudes improved from 1969 to 1972. It may be fruitful, then, to look at trends in indicator data in order to get a better understanding of changes in attitudes over a period of time.

Many indicators used in Pennsylvania's Assessment Program have been employed in other studies. The value of the Pennsylvania findings is that

the same indicators have been used for several years. When the same relationships consistently appear, it is apparent that the findings are not due to chance. Pennsylvania's indicators are valid factors in determining the quality of education.

SECTION IV

QUANTIFYING CITIZEN SUGGESTIONS OF INDICATORS

The problem of attaching a numerical value to such things as quality of teachers, morale of students or extent of extracurricular activities is a very difficult and hazardous undertaking. Rarely can a "perfect fit" be made between a numerical system and a particular phenomenon, but the process of quantification often leads to a better understanding of the phenomenon.

In this section, some citizen suggestions of indicators will be translated from narrative statements to numerical codes. Such coding should give citizens a way to compare their school to another school or to some established standard.

In order to obtain lists of indicators, educational coordinators of three civic organizations were asked to solicit opinions from members of their groups on what they considered to be indicators of good schools. The list submitted by Group One will be used to provide examples of how one might proceed to quantify an indicator. The indicators submitted by the other two groups were as follows:

Group Two Indicators

1. Educational background of teachers and administrators
2. Ability of teachers to motivate and inspire--discernible by hearing what students say
3. Pay Scale--If higher levels make for more stringent requirements as in 1 and 2
4. Colleges attended by graduates
5. Number of graduates attending college who stay four years
6. More basic research on learning needed to get true indicators
7. Student participation in extracurricular activities

8. Career decisions made during school years by students

9. Numbers of dropouts and reentries

10. Attitudes of students toward teachers and each other

11. Student participation in creative activities (band, art, etc.)

12. Display within school of students' creative work

13. Exhibits within community of school work and activities

14. Open channel of communications between school and parents

15. Absence of partisan policies in relation to school policies and teacher hiring

16. Conscientious, integrated curriculum planning

17. Requirement of meaningful inservice training and proper time to pursue it

18. Wholesome teaching environment, meaning time to teach and availability of good equipment

19. A good tax base

Group Three Indicators

1. Accessibility by students to teachers, guidance personnel, principals, and supervisory staff, and other school district staff other than in routine classroom relationships

2. Accessibility by parents or guardians of students to above

3. Adequate quality supervisory staff to insure that a properly trained and adequate teaching and support staff exists

4. Adequate and quality teaching force

5. Adequate and quality counseling and support staff, including the use of community resources

6. Adequate physical facilities to house the educational programs, including facilities for various extracurricular activities

7. Evidence of good financial management associated with the entire educational program

8. Evidence of good personnel management throughout the educational program

9. Adequate extracurricular activities, including interscholastic and intramural athletics

As can be seen from a short perusal of the lists, there is considerable overlap in the indicators thought to reflect good schools. The following discussion of Group One's indicators and Table 5 are provided to assist interested groups in making the next step in developing an understanding of their schools. No quantification scheme has been proposed for suggestions five and eleven.

Group One Indicators

1. What happens to a school's graduates? How many go on to college and where do they go?

   One could get a percentage figure by computing the ratio of those students enrolling in college to the number of graduates for that class. A better figure could be obtained by averaging two or more successive years of graduates who continued their education. Those gradutes who continue their education by enrolling in vocational, technical, nursing and business schools should also be included when obtaining percentages. In Pennsylvania, high schools are required to provide the Department of Education with these types of data concerning continuing education.

2. Is there some kind of career guidance or vocational guidance in this district?

   This indicator may not be restrictive enough, for the problem is not necessarily the existence of a career or vocational guidance program but the quality of the program. Many schools are now implementing career education programs in their elementary schools; however, results from these programs will not be available for many years. The best source of data

TABLE 5

QUANTIFICATION OF CITIZEN-SUGGESTED INDICATORS

Variable	Respondents	Measure	Coding	Index Description
1. CONTINUING EDUCATION	Administrators	The total of graduating seniors is divided into the total number who went on to a college or other institution of higher education.	In Per Cents	A higher per cent means that a greater proportion of seniors are continuing their education after high school.
2. GUIDANCE (1)	Students	How helpful do you find your guidance counselor when you ask about career information?	I have never asked for this kind of help. (1) Not helpful at all (2) Somewhat helpful (3) Very helpful (4)	A higher score indicates that students are more positive in their perceptions of their counselors' ability to provide career guidance.
GUIDANCE (2)	Students	How often have you had the chance to visit places of work to help you in your choice of a career?	Never (1) Once (2) Two or three times (3) More than three times (4)	A higher score indicates more opportunities for the students to visit places of work.
3. TEACHER'S COLLEGE (1)	Teachers	Indicate what type of institution granted your most recent degree.	No Degree (1) State College (2) Liberal Arts College or Univerasity (3)	A higher score indicates that the staff is more likely to have degrees and to have attended a Liberal Arts College or University than a State College.
TEACHER'S COLLEGE (2)	Teachers	Indicate the locality of the institution where you did most of your undergraduate study.	This town or immediate area (1) In state but outside this town (2) In another state or outside continental US (3)	A higher value indicates that the school draws its staff from more remote colleges or universities.
PROFESSIONAL ACTIVITIES	Administrators and Teachers	How much time do you spend, on the average, in professional activities not directly related to your job (teacher's organization, professional groups, etc.)?	1 hour or less per week (1) 2 to 4 hours per week (2) 5 or more hours per week (3)	A higher value indicates more teacher involvement with professional activities outside the job itself.
4. TAX EFFORT INDEX	Administrator	Divide the total budgeted school taxes by the local market values.	Expressed in mills	A higher value indicates that the public is more willing to tax itself for educational purposes.

TABLE 5 (Continued)

QUANTIFICATION OF CITIZEN-SUGGESTED INDICATORS

Variable	Respondents	Measure	Coding		Index Description
6. SCHOOL DISCIPLINE	Teachers Students Parents	In the following five-point scale rate your school administration's discipline policies somewhere from "Too Rigid" to "Too Permissive".	Too Rigid Rigid Neither Permissive Too Permissive	(1) (2) (3) (2) (1)	A higher value indicates a perception of the school administration as being more balanced between rigidity and permissiveness.
7. SPECIAL SERVICES	Taxpayers	For each school service in the following list, decide how adequately your school district has provided it. Swimming Special Education Arts and Crafts, etc.	Inadequately Somewhat Inadequately Adequately	(1) (2) (3)	A higher value indicates a more adequate program of special services, as provided by the school district. However, scores may be contaminated by the perceptions of taxpayers who feel that certain services are not needed.
8. PROFESSIONALISM	Teachers	How many courses or professional learning situations, other than what is strictly required for your job, have you been involved in in the last year?	Expressed In Whole Numbers		A higher value indicates more willingness to broaden oneself professionally.
9. LABOR RELATIONS	Teachers Administrators	How would you characterize the relationship between teachers and administration in your school district during the past calendar year?	Openly Hostile Tense Calm Positive Very Positive	(1) (2) (3) (4) (5)	A higher value indicates a more congenial relationship between teachers and administration.
10. PERSONNEL TURNOVER	Superintendents	Divide the number of full-time teachers (or administrators) you hired in the last year by the number of full-time teaching (or administrative) positions now filled in the district.	In per cents		A higher per cent indicates a higher rate of teacher (or administrator) turnover. Where the administrative staff is very small, this percentage may be misleading.
12. COMMUNITY RESOURCES (1)	Administrators	Tally the number of field trips made and sites visited. Compare sites visited to those that could have been visited.	In Proportions		A higher number of visits indicates a greater willingness to use community resources.

TABLE 5 (Continued)

QUANTIFICATION OF CITIZEN-SUGGESTED INDICATORS

	Variable	Respondents	Measure	Coding	Index Description
	COMMUNITY RESOURCES (2)	Administrators	Average total number of hours of work per week donated to the school by volunteers.	In Whole Numbers	A higher number indicates willingness of a school district or building administrator to utilize volunteer helpers.
13.	OPENNESS	Superintendents	How often does the district communicate with the general public by way of press releases, newsletters, or other media?	More than once a week (5) Weekly or Bi-weekly (4) Monthly or Bi-monthly (3) Every two to six months (2) Less than twice yearly (1)	A higher value indicates more openness in school communications. A higher value however, may also be an outgrowth of public demands for more information or of criticism of schools.

for this indicator would be students. Information from responses to questions about the assistance they received when seeking career information and the opportunities they have had to visit places of work would aid in the determination of the quality of the program.

3. What about the quality of teachers? What colleges do they come from? Do they have broad interests; i.e., interests outside the school?

The quality of teachers is almost impossible to quantify because of the different requirements imposed on teachers. Required skills may differ considerably between an elementary and secondary teacher, an algebra teacher and a special education teacher, a teacher in a traditional school and one in an innovative school. Many attempts have been made to identify characteristics which are common to all good teachers, but concensus has not yet been reached. Rosenshine and Furth (3) have listed some characteristics associated with quality teachers: clarity, variability, enthusiasm and task-oriented behaviors.

The second part of this indicator is less difficult to quantify. One can easily obtain percentages of teachers graduating from universities, those from state colleges or those from liberal arts colleges. Also to be considered is "localism" of the college attended by teachers. For example, researchers in the Division of Educational Quality Assessment (EQA) have found instances where 90 per cent of a school faculty graduated from the same college. A method of rating colleges has been devised (see The Gourman Report) (4) and was

used by Summers and Wolfe in their study of Philadelphia schools. (5)

For the third part of this indicator a questionnaire could be designed to obtain responses from teachers about their participation in professional groups (offices held, committee memberships) in order to determine to some extent the teachers' outside activities.

4. Does a higher tax rate (even though we don't like it) probably indicate that schools mean more to the community?

It may be that tax rates are directly comparable in some states; however, rates may be misleading if assessment factors are inconsistent. In Pennsylvania a Tax Effort Index was determined by dividing budgeted school taxes by market values.

5. What is the school's rapport with the community? Is it hostile or open?

Many districts now have citizen advisory committees in order to maintain good rapport between the school and community. New Jersey has developed a series of handbooks on comprehensive planning, and persons either considering the formation of citizen committees or conducting needs assessments would do well to consult these materials. (Contact State of New Jersey, Department of Education, Bureau of Planning, 225 West State Street, Trenton, New Jersey, 08625.)

6. Is the administrative staff either too rigid or too permissive? (We would tend to avoid a school where the main emphasis is on monitoring student behavior--especially such things as length of hair, underground newspapers, etc.)

This is an indicator of school discipline and, according to Gallup Polls, (6) parents feel discipline is one of the

major problems of schools. One source of data would be a review of the reasons given for expulsions, suspensions, and detentions. Another source would be student replies to questions about school rules.

7. Does the school offer special services and a wide variety of them?

The problem with this indicator lies in the term "special services." If a school has a swimming pool, swimming would be considered a part of the physical education program; if a swimming pool is not owned by a school, however, a special service might be required to provide this activity for children. It would be difficult to obtain comparable data for this indicator. Parents could be surveyed to see if they felt the school was offering an adequate variety of special services.

8. Are school employees professional? We mean by this, do they respect their position in the community, and are they willing to improve professionally (not just to strike and get a big raise)?

This indicator has some overlap with number three. Useful data might be obtained from the number of teachers who are taking additional college courses or who are voluntarily involved with inservice workshops.

9. What is the status of the school's labor relations? Have there been any recent strikes? (We would tend to avoid a school where strikes have occurred or where they are imminent.)

On the surface, this indicator is easy to quantify by assigning a 1 if a strike has occurred and a 0 otherwise. This dichotomy could be very misleading, however. A strike may have occurred and been settled amicably, with a good working climate as the result. On the other hand, a poor

working climate may be continued if a strike is prohibited by law.

Indicator ten may be a better reflection of what the group intended to convey by indicator nine.

10. Is the morale of the school generally good or are teachers and principals always complaining, making excuses?

Three indicators used by Pennsylvania which relate to teacher morale are Perception of the Learning Atmosphere, Perception of School Administrator, and Teacher Satisfaction with Parents, Teachers and Pupils. Another quantification of this variable could be the rate of teacher turnover or principal turnover.

11. Does the school use community advisory groups to help provide input and understanding of community interests and needs?

If an advisory group exists, one should examine the membership list to see if it reflects the geographic, ethnic and socioeconomic composition of the community. Further, one should know the frequency of the group's meetings and the topics discussed. A comparison between the advisory committee's minutes and the school board's minutes could be used as a way of examining the committee's influence.

12. Does the school use community resources and volunteers in assisting the school staff in the overall educational mission of the schools?

One measure of community resource use would be the number of field trips taken during the school year; another would be the number of times guest speakers from the community have presented programs. A third measure would be the number of hours volunteers have served as teacher assistants, library helpers, etc.

13. Is the school open to public media, and does the school make use of the general media to inform the public?

Use of the media might be determined by the existence of a school district newsletter or by regular reports in the local newspaper or on television or radio. Openness could be reflected by the school boards conducting their meetings in open session.

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